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**ENVIRONMENTAL MANAGEMENT** **0680/22**

Paper 2 Management in Context **May/June 2026**

**1 hour 45 minutes**

You must answer on the question paper.

No additional materials are needed.

**INSTRUCTIONS**

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen. Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

**INFORMATION**

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **24** pages.

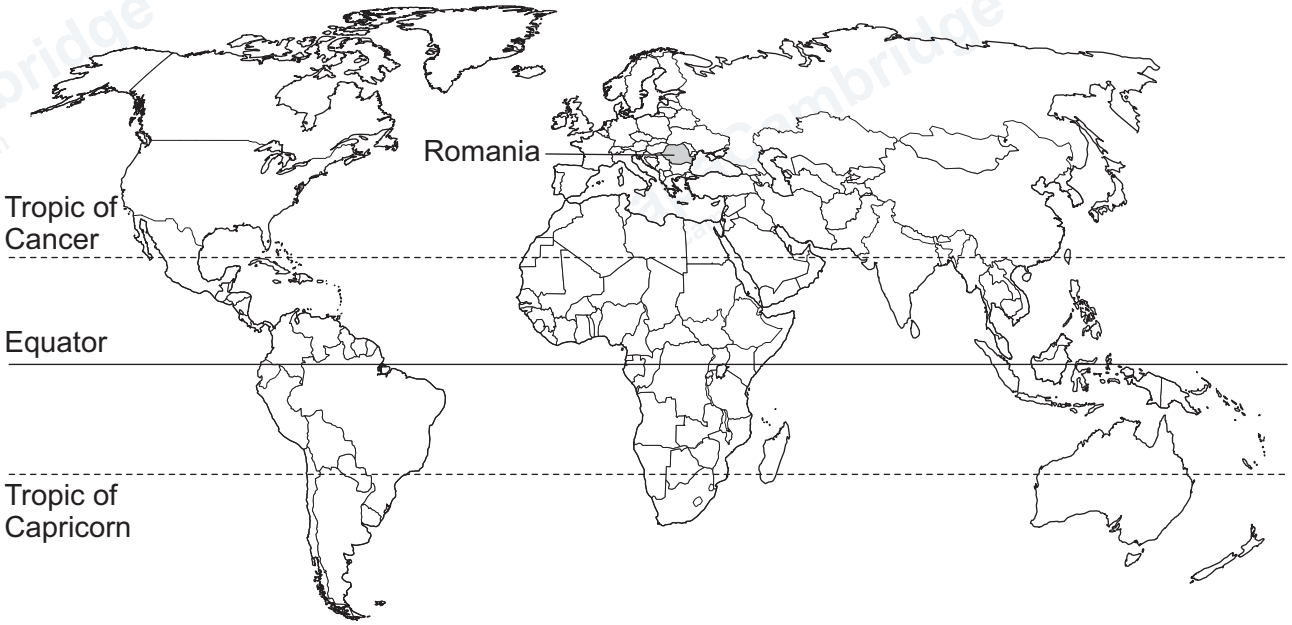
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**world map showing the location of Romania**




**map of Romania**

**key**

★ capital city

international boundary




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**Area of Romania:** 238 391 $km^2$

**Population of Romania:** 19 million (in 2024)

**Children per woman in Romania:** 1.63 (in 2024)

**Life expectancy in Romania:** 76.9 years

**Currency:** Romanian leu (4.58 RON = 1 USD in 2024)

**Language:** Romanian, Hungarian, Romani

**Climate of Romania:** cold winters with snow, warm summers with frequent storms

**Terrain of Romania:** central area of flat land with mountains in the east and south

**Main economic activities of Romania:** vehicle assembly, textiles, food processing, mining, timber

The capital city, Bucharest, is the largest urban area in Romania. The country has decreasing reserves of petroleum. There are reserves of natural gas, coal, timber and salt. Earthquakes are common in the south and southwest.

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**1** **(a)** The graph shows the population of Romania from 1844 to 2020.




**(i)** Describe the change in population from 1844 to 2020 shown by the graph.

.....

.....

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..... [3]

**(ii)** The graph is plotted with a non-linear scale on the *x*-axis.

Suggest **one** problem with using a non-linear scale.

.....

..... [1]

**(b)** **(i)** The capital city, Bucharest, had a population of 1.768 million in 2024.

Calculate the percentage of the population who lived in Bucharest in 2024.

Give your answer to the nearest whole number.

..... % [2]

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**(ii)** The table shows the percentage of the population that lived in urban areas in Romania.

| year | percentage of the population that lived in urban areas |
|---|---|
| 2012 | 53.97 |
| 2013 | 53.94 |
| 2014 | 53.90 |
| 2015 | 53.89 |
| 2016 | 53.90 |
| 2017 | 53.94 |
| 2018 | 54.00 |
| 2019 | 54.08 |
| 2020 | 54.19 |
| 2021 | 54.33 |
| 2022 | 54.49 |

Describe what the data shows about the percentage of the population that lived in urban areas in Romania between 2012 and 2022.

.....

.....

.....

..... [2]

**(c) (i)** Calculate the population density for Romania in 2024.

Give the unit for your answer.

population density = ..... unit ..... [2]

**(ii)** Suggest why an increase in population density can cause a shortage of drinking water.

.....

..... [1]

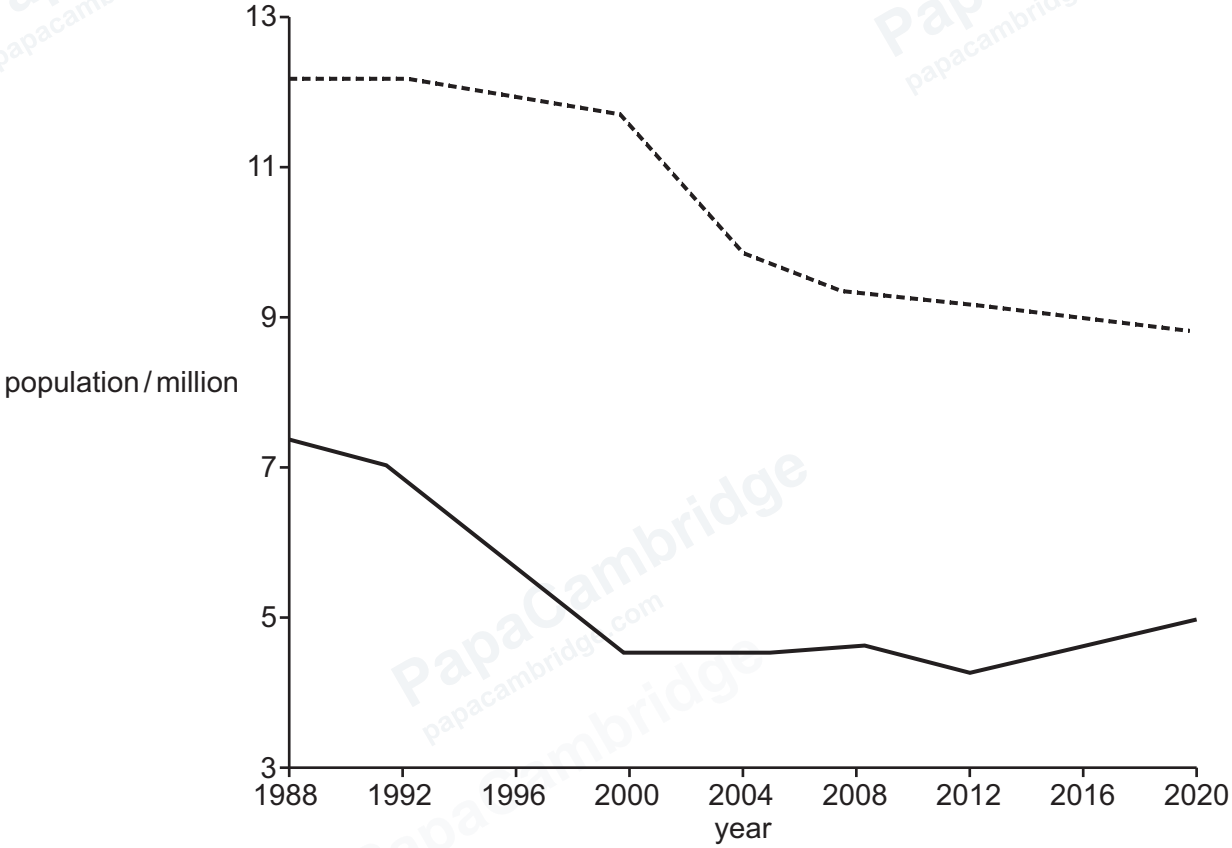
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**(d)** The graph shows the number of employed people compared to the total number of people of working age in Romania from 1988 to 2020.

**key**

--- total number of people of working age

— number of employed people




Suggest **two** reasons for the difference between the two lines shown in the graph.

1 .....

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2 .....

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[2]

**(e)** Explain why education is a strategy for managing human population size.

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..... [2]

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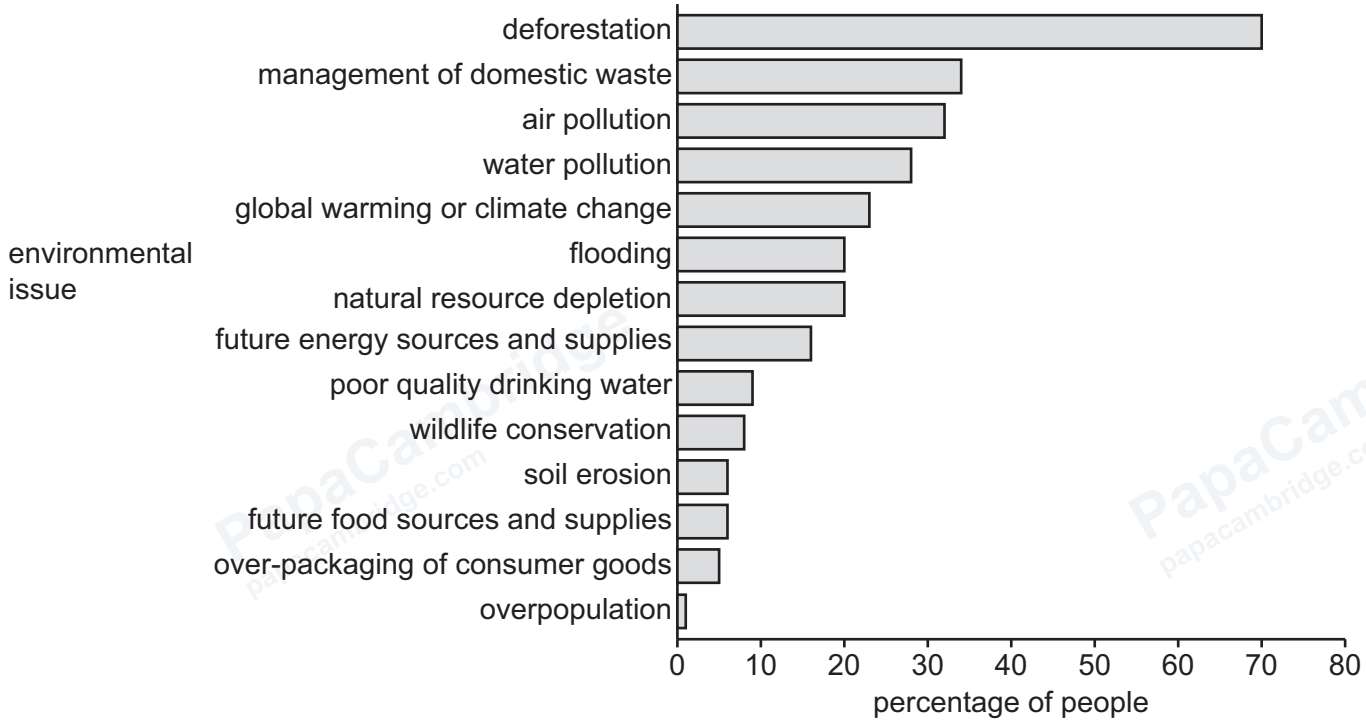
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**(f)** People living in Romania were surveyed about environmental issues using an online questionnaire.

They were asked:

'What are the three most important environmental issues in Romania today?'

The bar chart shows results from the survey.




The data is used by the Romanian Government to decide which environmental management strategies to invest in.

**(i)** A list of strategies is shown.

| strategy | order |
|---|---|
| create a national park | |
| grow more cash crops | |
| monitor air quality | |
| plant trees | |
| reduce extraction of minerals | |

Put the strategies in order of importance using the information from the bar chart.

Use 1 for most important and 5 for least important.

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**(ii)** 20% of people were concerned about flooding.

Explain how a disaster plan manages the impacts **after** flooding has occurred.

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..... [4]

**(iii)** Describe how flooding can increase crop yield in the long term.

.....

.....

.....

..... [2]

**(iv)** Suggest **one** impact of over-packaging of consumer goods on the environment.

.....

..... [1]

**(v)** A student repeats the survey one year later.

Suggest **two** pieces of information the student needs to allow the results of the surveys to be compared.

1 .....

.....

2 .....

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[2]

[Total: 26]

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**2** Salinisation of soil is an impact of irrigation mismanagement.

Salinisation increases the concentration of salts in soil.

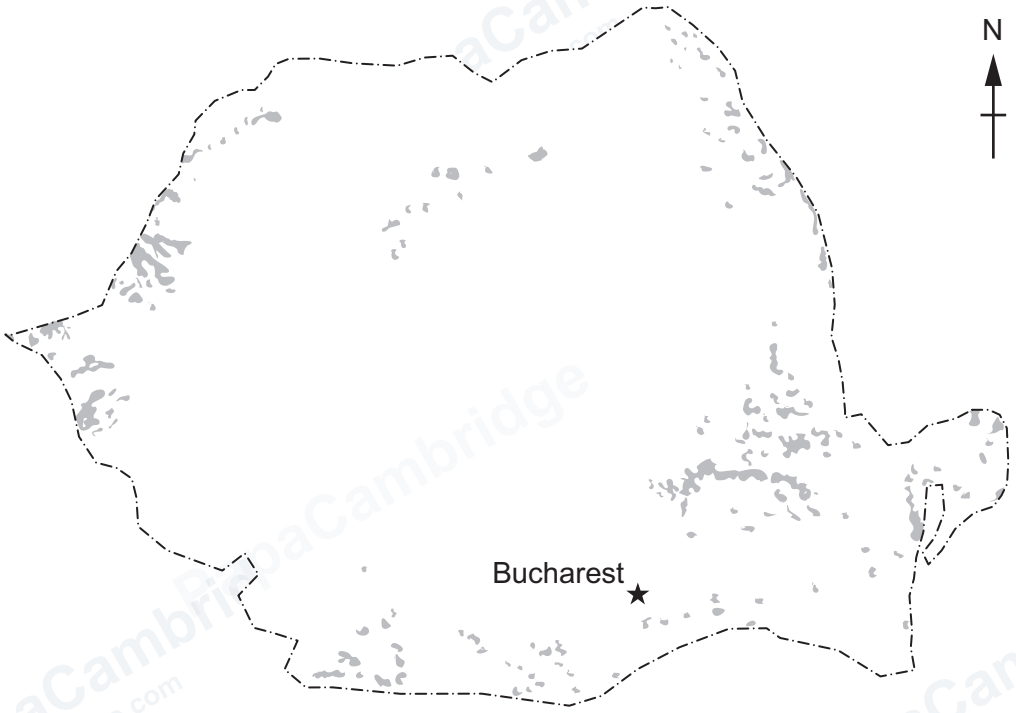
**(a)** The map shows soils impacted by salinisation in Romania.

**key**

★ capital city

international border

salinisation




Describe the distribution of salinisation shown on the map.

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..... [3]

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**(b)** A scientist analyses the impact of salinisation on photosynthesis.

The scientist uses this method.

- Grow four plants, **A**, **B**, **C** and **D**, of the same species in pots containing the same soil.
- Water each plant twice a week with 1 $dm^3$ of salt water.
- Use a different concentration of salt water for each plant.
- Analyse the concentration of chlorophyll in the leaves of each plant after 1 month.

Identify **three** variables that must be controlled in this investigation.

1 .....

2 .....

3 .....

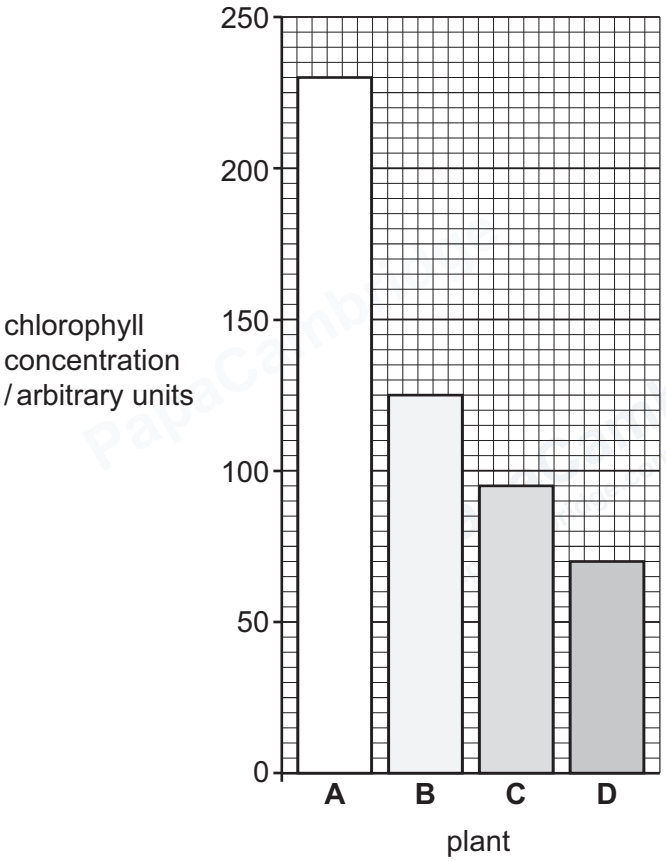
[3]

**(c)** The bar chart shows the results.

**key**

salt concentration

- 0 arbitrary units
- 75 arbitrary units
- 150 arbitrary units
- 300 arbitrary units




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**(i)** Suggest why salt is **not** added to the water for plant **A**.

..... [1]

**(ii)** The scientist repeats the investigation with eight more plants.

Explain the benefit of this.

.....

..... [1]

**(iii)** Use the data to write a conclusion about the effect of salt concentration on chlorophyll concentration.

.....

..... [1]

**(iv)** Explain why the scientist uses chlorophyll concentration to investigate photosynthesis.

.....

..... [1]

**(v)** Write the word equation for photosynthesis.

..... [2]

**(vi)** The scientist observes that the leaves of the plants turn brown with greater salt concentrations.

The scientist uses this scale to record this observation.

| observation |
|---|
| no brown |
| some brown |
| half brown and half green |
| mostly brown |

Suggest **one** limitation of this method of recording observations.

..... [1]

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**(d)** Salinisation also impacts ground water.

The table shows the recommended use of water for different salt concentrations in the water.

| salt concentration in mg / dm$^3$ | use |
|---|---|
| <500 | drinking and irrigation |
| 500–1500 | irrigation |
| 1501–15 000 | livestock |
| >15 000 | mining and industry |

The table shows data from 5 water sources, **V**, **W**, **X**, **Y** and **Z**.

| water source | salt concentration in mg / dm$^3$ |
|---|---|
| **V** | 300 |
| **W** | 250 |
| **X** | 1500 |
| **Y** | 7500 |
| **Z** | 500 |

Identify the number of sources that can be used for irrigation.

number of sources = ..... [1]

**(e)** Salt is added to roads in the winter to prevent ice from forming on the road surface.

Explain why this increases the chance of salinisation.

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..... [2]

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**(f)** Desalination is used to convert salt water to drinking water.

**(i)** Name the process in desalination that converts salt water to drinking water.

..... [1]

**(ii)** A desalination plant converts salt water from the Black Sea to drinking water.

The plant supplies 15 $m^3$ / minute of desalinated water.

Calculate the maximum volume of water the plant can supply in 24 hours.

maximum volume = ..... $m^3$ [1]

**(iii)** 300 million people around the world rely on desalinated water.

Land-based desalination plants need large amounts of energy to remove salt from salt water.

Salt water in very high concentrations is a waste product.

Suggest **two** reasons why poorly managed desalination can cause loss of biodiversity in a marine ecosystem.

1 .....

.....

2 .....

.....

[2]

**(iv)** Floating desalination plants are an alternative to land-based desalination plants.

These floating plants are located on water and are 8 m × 5 m. They can produce up to 49 000 $dm^3$ of drinking water per day.

They are powered by the movement of waves and need 1 m high waves to work.

Suggest **two** advantages of floating desalination plants compared to land-based plants.

1 .....

.....

2 .....

.....

[2]

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**(g)** The photograph shows the change of water level in a reservoir in Romania.




Suggest **two** reasons for the change of water level.

1 .....

.....

2 .....

.....

[2]

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**(h)** The photograph shows a waste water pipe that empties into a river in Romania.



One impact of waste water is nutrient enrichment and eutrophication in rivers.

Suggest **two** other impacts.

1 .....

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2 .....

.....

[2]

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**(i)** Eutrophication causes an increase in algal biomass.

A scientist investigates how the concentration of nitrate ions in water affects algal biomass.

The table shows the results.

| nitrate ion concentration in mg / dm$^3$ | algal biomass in mg / dm$^3$ |
|---|---|
| 4 | 1.0 |
| 5 | 1.4 |
| 6 | 2.6 |
| 7 | 4.0 |
| 8 | 4.8 |
| 9 | 2.0 |
| 10 | 9.6 |

**(i)** Circle the anomalous point in the table. [1]

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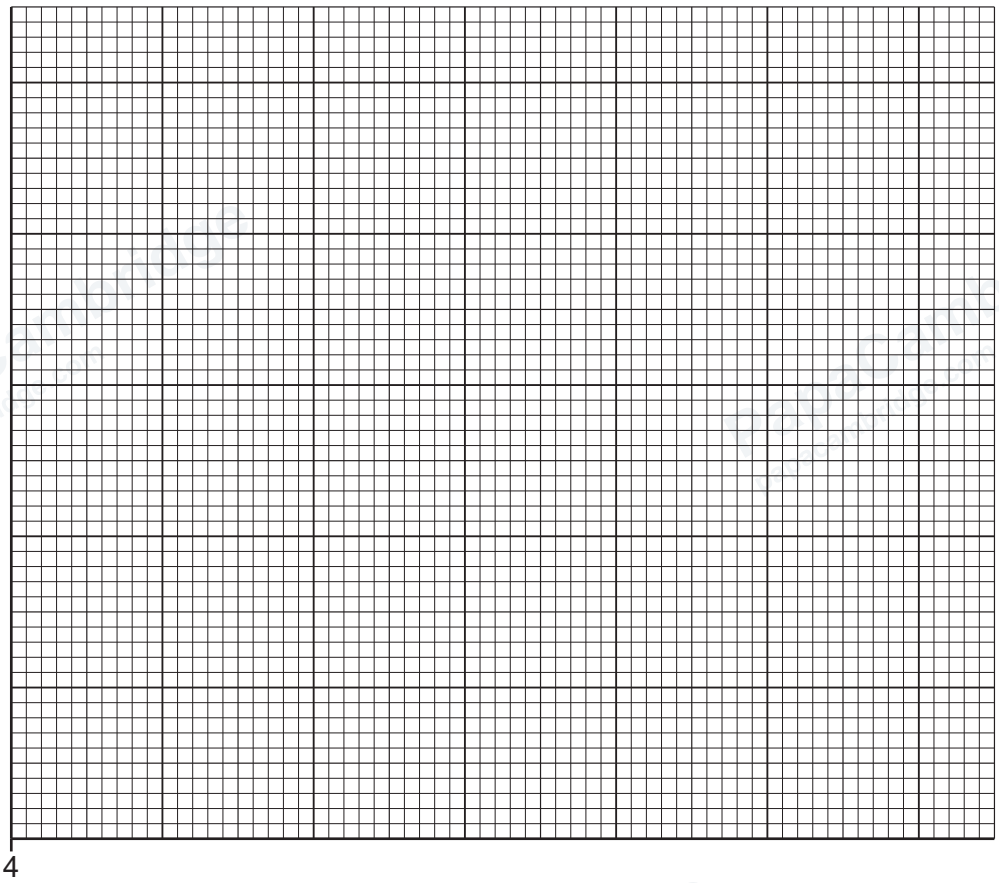
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**(ii)** Plot the results on the grid.
Draw a curve of best fit for the data.

Part of the graph has been completed for you.




[4]

**(iii)** Complete the sentences about eutrophication.

An algal bloom forms.

This means that ..... cannot reach plants that grow under the water surface.

Water plants die because they cannot ..... .

Bacteria increase in number as they ..... dead water plants.

Bacteria use up the ..... content of water when they respire.

Aquatic animals suffocate and die.

[4]

[Total: 35]

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**3** The Carpathian Mountains in Romania are a popular tourist destination.

**(a)** The photograph shows the Transfăgărășan Highway, a 150 km road that provides access to the Carpathian Mountains.



**(i)** Loss of habitat and loss of biodiversity are two impacts of tourism.

Suggest **two** other impacts of tourism on the Carpathian Mountain ecosystem.

1 .....

.....

2 .....

.....

[2]

**(ii)** Some parts of the Transfăgărășan Highway have been deforested.

Deforestation causes loss of habitat and loss of biodiversity.

State **three** other impacts of deforestation.

1 .....

2 .....

3 .....

[3]

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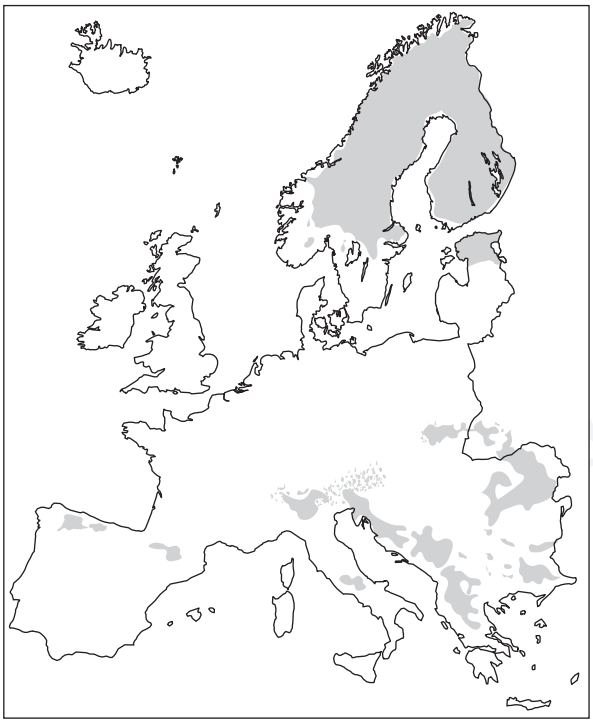
**(b)** The photograph shows a Eurasian brown bear next to the Transfăgărășan Highway.



The map shows brown bear populations in Europe.

**key**

brown bear population



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There are approximately 6000 brown bears in Romania.

Suggest **two** reasons why brown bear populations are **not** found in all European countries.

1 .....

.....

2 .....

.....

[2]

**(c)** A biosphere reserve is a strategy to conserve biodiversity.

There are three main zones in a biosphere reserve:

a central core zone, a middle buffer zone and an outer transition zone.

Explain how a biosphere reserve is used to conserve biodiversity.

.....

.....

.....

.....

.....

..... [3]

**(d)** **(i)** A food chain for brown bears is shown.

apple tree → ant → caterpillar → brown bear

Describe fully what this food chain shows.

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..... [4]

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**(ii)** State **three** abiotic factors of an ecosystem.

1 .....

2 .....

3 .....

[3]

**(iii)** Draw a line from each description to the correct term.

| description | term |
|---|---|
| The interaction of organisms and non-living components in an environment. | ecosystem |
| The role of an organism. | community |
| Two or more populations of organisms. | habitat |
| | niche |

[2]

[Total: 19]

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